

What is Claimed Is:

1. 1 1. A system for detecting a signal having a target frequency, comprising:
 1. 2 a first filter having a first center frequency and a first transfer function, wherein said first
 1. 3 center frequency is greater than said target frequency;
 1. 4 a second filter having a second center frequency and a second transfer function, wherein
 1. 5 said second center frequency is less than said target frequency and wherein the phases of said
 1. 6 first and second transfer functions differ by 180 degrees about said target frequency; and
 1. 7 a running cross-correlator interconnected to said first and second filters for comparing
 1. 8 said first and second transfer functions over time.
1. 1 2. The system of claim 1, wherein said running cross-correlator comprises a cross-correlator
 1. 2 having a predefined integration time interconnected to a low pass filter having a frequency that is
 1. 3 inversely proportional to said integration time of said cross-correlator.
1. 1 3. The system of claim 2, further comprising first and second saturating non-linearities
 1. 2 interconnecting said first and second filter to said cross-correlator.
1. 1 4. The system of claim 3, wherein said saturating non-linearities are signum functions.

1. 1 5. A method for detecting a signal having a target frequency in wideband noise, comprising
1. 2 the steps of:

1. 3 (a) filtering said wideband noise with a first filter having a first center frequency and
1. 4 a first transfer function, wherein the first center frequency is lower than said target frequency;

1. 5 (b) filtering said wideband noise with a second filter having a second center
1. 6 frequency and a second transfer function, wherein said second center frequency is higher than
1. 7 said target frequency and wherein the phases of said first and second transfer functions differ by
1. 8 180 degrees about said target frequency;

1. 9 (c) processing the outputs of said first and second filters with a saturating non-
1. 10 linearity component;

1. 11 (d) performing a running cross-correlation of the saturating non-linear outputs of said
1. 12 first and second filters; and

1. 13 (e) determining said signal is present when said running cross-correlation drops
1. 14 below a predetermined threshold.

1. 1 6. The method of claim 5, wherein the step of performing a running cross-correlation
1. 2 comprises providing the saturating, non-linear outputs of said first and second filters to a cross-
1. 3 correlator and then filtering with a low-pass filter that determines said integration time of said
1. 4 running cross-correlation.

1. 1 7. The method of claim 6, wherein the step of processing said first and second outputs with
1. 2 a saturating non-linearity is performed by a signum function.